NIKKO CASSETTE DECK

D-30W

STEREO DOUBLE
CASSETTE DECK

SERVICE MANUAL

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1 SPECIFICATIONS AND SERVICE DATA

SPECIFICATIONS

Track System 4-track, 2-channel stereo
Heads PLAY A: Playback x 1
REC/PLAY B: Erase x 1, Record/Playback x 1
Type of Tape Cassette tape, C-60 and C-90
Tape Speed 4.8 cm/s (1-7/8 ips), 9.5 cm/s (3-3/4 ips); Hi speed Dubbing)
Input (level and impedance)
MIC: Specified input level: –57 dB (1.09 mV)/5 kohms
Min. input level: –67 dB (346μV)
LINE IN: Specified input level: –9 dB (275 mV)/50 kohms
Min. input level: –19 dB (86.9 mV)
Output (level and load impedance)
OUTPUT: Spec. output level: –3.5 dB (518 mV)/50 kohms
PHONES: Spec. output level: –19 dB (86.9 mV)/8 ohms
Equalization
METAL: 3180 μs + 70 μs
CrO_2: 3180 μs + 70 μs
NORMAL: 3180 μs + 120 μs
Head Configuration
1/2-track, 1-channel erase head
1/4-track, 2-channel record/playback head
Motor PLAY A: 1 DC servo motor, REC/PLAY B: 1 DC servo motor
Bias Frequency 100 kHz
Operation position Horizontal
Power Requirements
120 V AC, 60 Hz (U.S.A./Canada)
220 V AC, 50 Hz (Europe)
Power Consumption 12 W
Weight 4.6 kg (10-1/8 lbs.) net
Dimensions

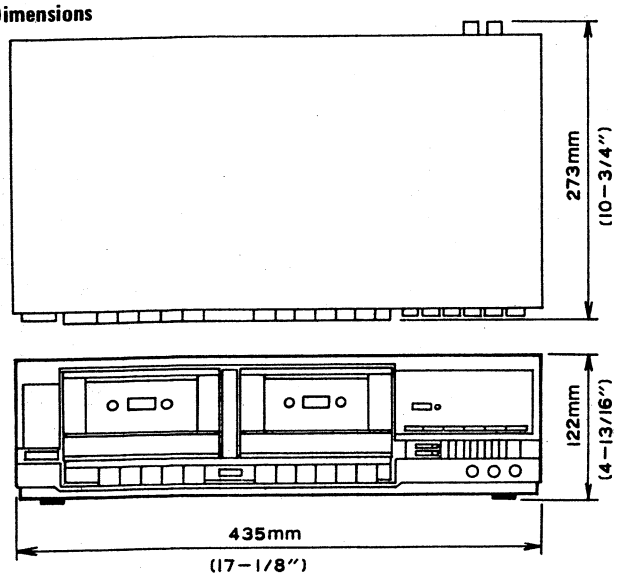


Fig. 1-1

SERVICE DATA

MECHANICAL

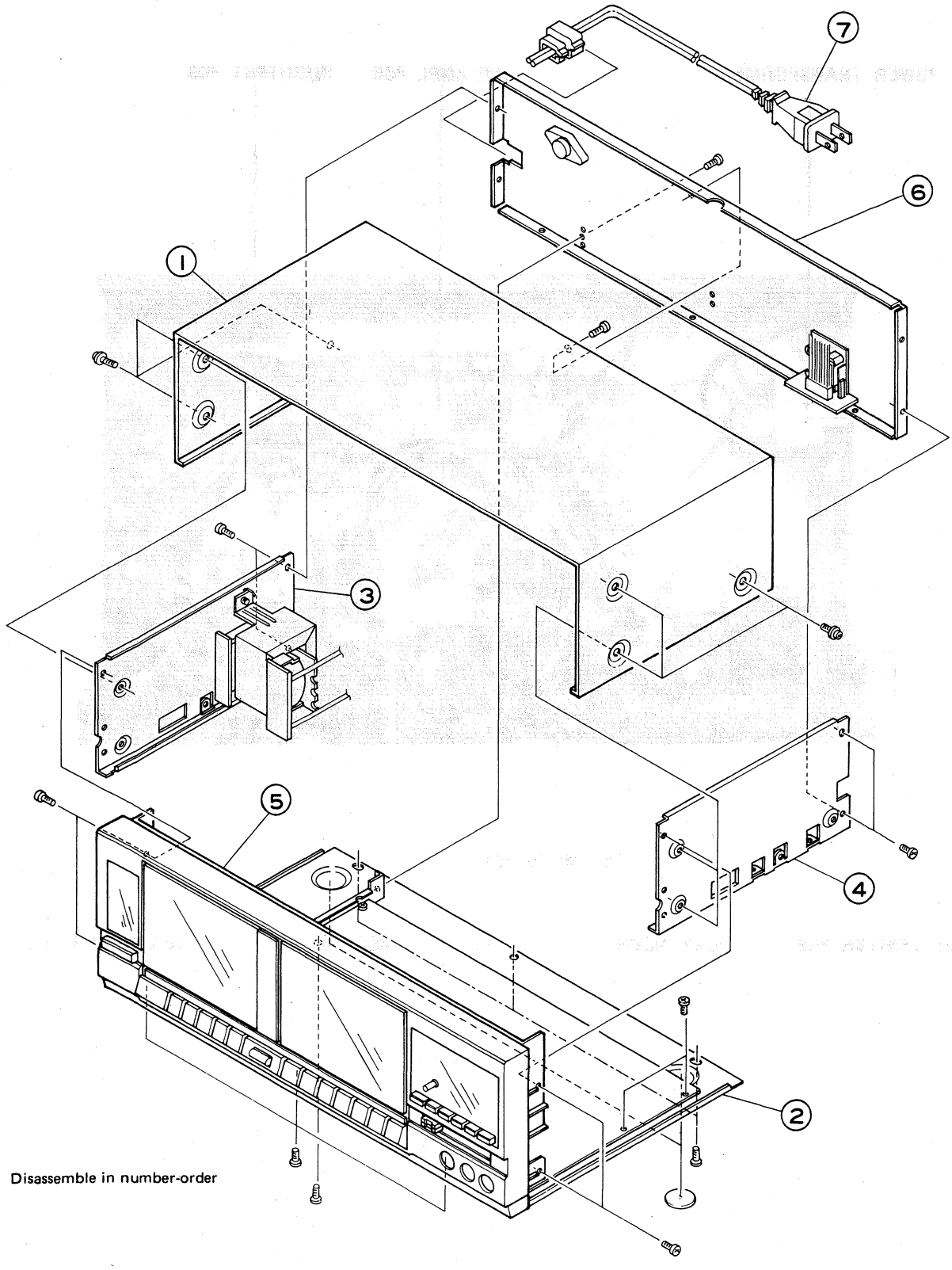
Tape Speed Deviation 3,000 Hz +90, –60 Hz, 6000 Hz +180, –120 Hz
Tape Speed Drift 45Hz (LOW SPEED), 90Hz (HIGH SPEED)
Wow and Flutter
Playback: 0.32% (RMS)
Pinch Roller Pressure 250 g to 470 g (8.8 oz to 16.5 oz)
Reel Torque
Take-up: 35 to 75 g-cm (0.49 to 1.04 oz-inch)
Supply: 2 to 6 g-cm (0.028 to 0.083 oz-inch)
F.F.: 70 to 160 g-cm (0.97 to 2.22 oz-inch)
REW: 70 to 160 g-cm (0.97 to 2.22 oz-inch)
Fast Wind Time
115 ± 10 sec. for MTT-551 (C-60)
Auto End-stop Time 6 sec. or less

ELECTRICAL

Frequency Response
See Figs. 5-8 to 5-11.
Signal-to-noise Ratio
Playback NORMAL: 46 dB min.
Record/playback
METAL, CrO_2: 46 dB min.
NORMAL: 45 dB min.
Erase Efficiency
65 dB min. at 1 kHz (measured with input 10 dB higher than the specified input level).
Channel Separation 30 dB min. at 1 kHz
Adjacent Track Crosstalk 40 dB min. at 125 Hz
Total Harmonic Distortion 2.5% or less with NORMAL, CrO_2, METAL

NOTES:
Improvements may result in SPECIFICATIONS AND SERVICE DATA changes.
Value of "dB" in the data refers to 0 dB (0.775 V), except where Specified.

2 CASE AND FRONT PANEL REMOVAL



Disassemble in number-order

3 PARTS LOCATION

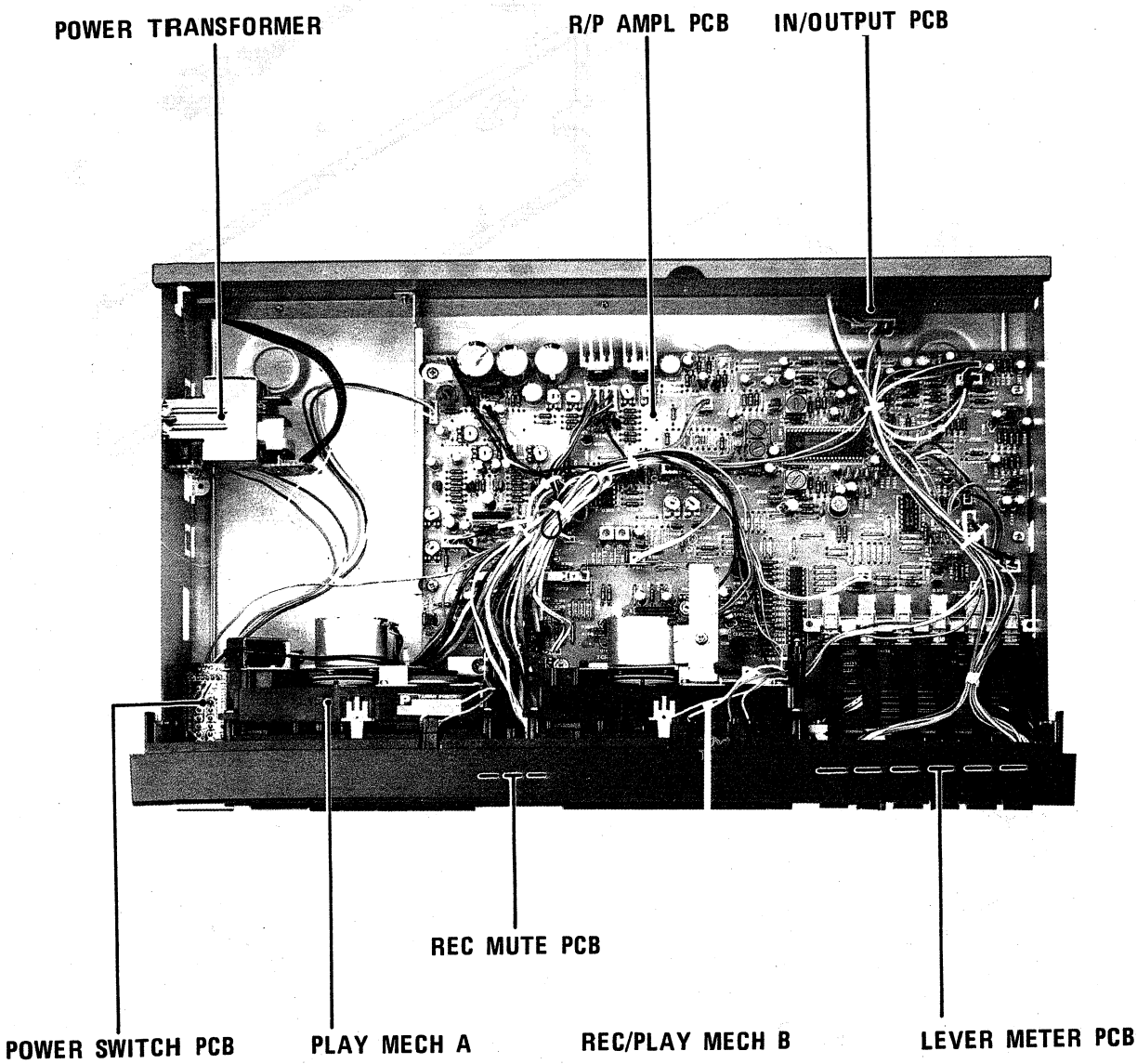


Fig. 3-1 Top view

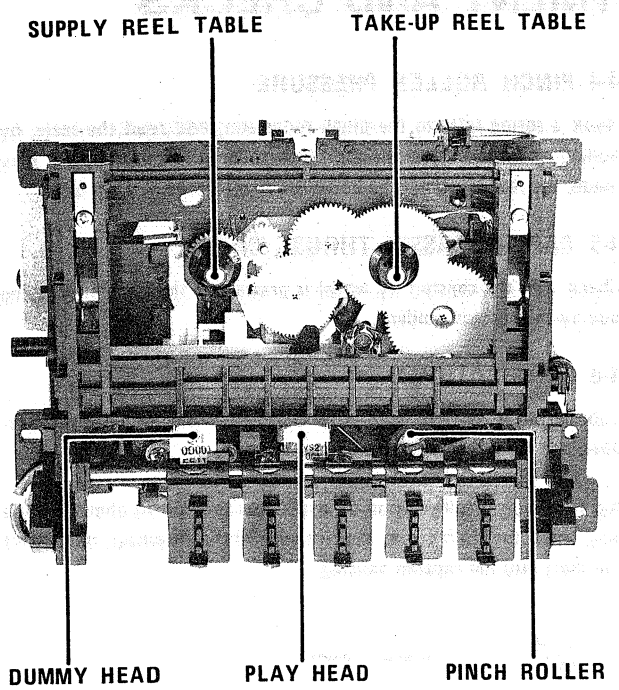


Fig. 3-2 Transport front view (PLAY A)

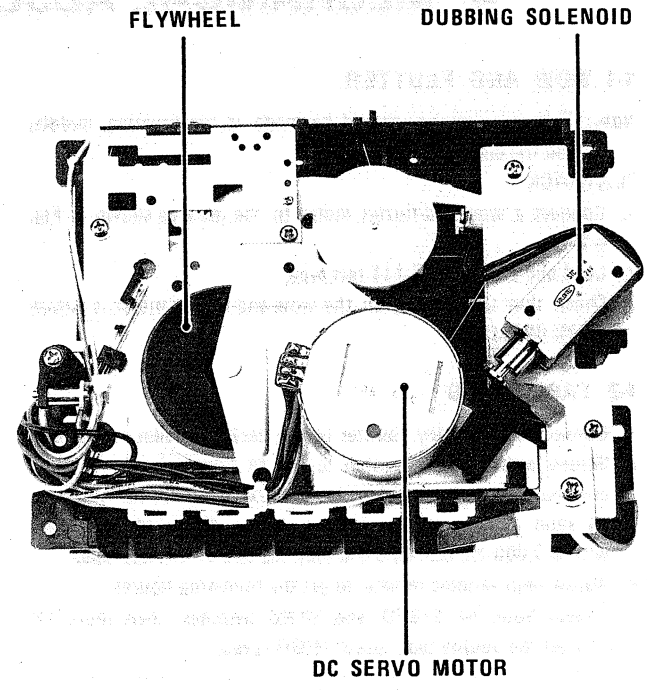


Fig. 3-3 Transport rear view (PLAY A)

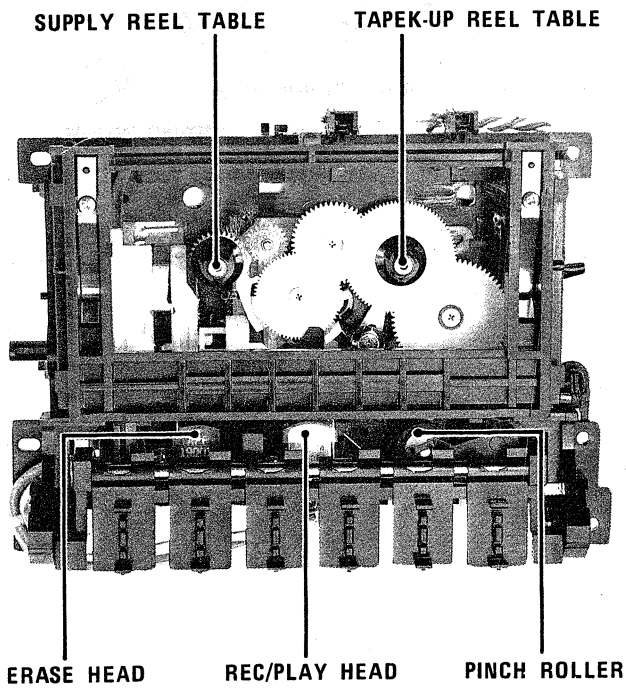


Fig. 3-4 Transport front view (REC/PLAY B)

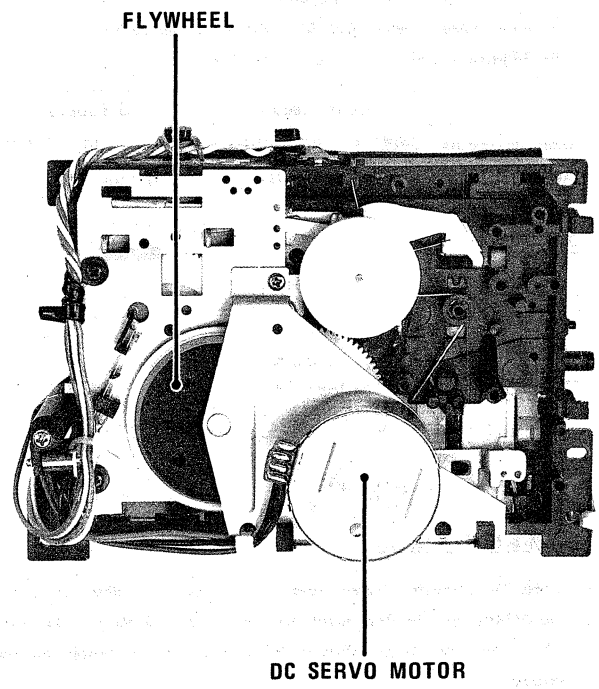


Fig. 3-5 Transport rear view (REC/PLAY B)

4 MECHANICAL ADJUSTMENT AND CHECKS

4-1 WOW AND FLUTTER

Note: This measurement should be made at the begining, middle, and the end of the tape.

PLAYBACK

1. Connect a wow-and-flutter meter to the deck as shown in Fig. 4-1.
2. Load and play a MTT-111 test tape.
3. Check that the reading on the wow-and-flutter meter is within 0.32% (WRMS).

4-2 TAPE SPEED

1. Connect a frequency counter to the deck as shown in Fig. 4-1.
2. Simply press POWER switch to ON to rotate the motor, then continue the motor rotation for approx. 1 minute for warm-up.
3. As soon as the warm-up finishes, load a MTT-111 test tape with a 3,000 Hz test tone and play the end of the test tape.
4. Adjust each variable resistor to get the following figures.
   * Press both HI SPEED and SYNC switches, then short TP to get the double tape speed (HIGH speed).

	Adjustment point		Adjustment value
PLAY I	HIGH speed	R36	6030 ~ 6070
	LOW speed	R35	3015 ~ 3035
REC/PLAY II	HIGH speed	R34	5990 ~ 6030
	LOW speed	R33	2995 ~ 3015

   * At first, adjust HIGH tape speed.
5. In play mode, check that the following figures are obtained at the beginning and at the end of the tape.

	LOW speed	HIGH speed
Speed deviation	3000 Hz +90, –60 Hz	6000 Hz +180, –120 Hz
Speed drifting	Within 450 Hz	Within 90 Hz

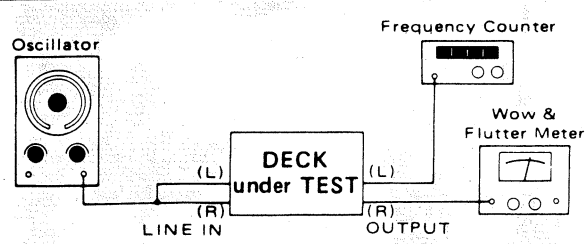


Fig. 4-1

4-3 REEL TORQUE

1. Load the cassette torque meter on the deck and read the pointer indication on the dial scale for each tape transport operation. The measured torque should be within the following specified values:

   Specifications:

   Take-up: 35 ~ 75 g-cm (0.49 ~ 1.04 oz-inch)

   Supply: 2 ~ 6 g-cm (0.028 ~ 0.083 oz-inch)

   F.F./REW: 70 ~ 160 g-cm (0.97 ~ 2.2 oz-inch)

4-4 PINCH ROLLER PRESSURE

Hook a spring scale to the pinch roller arm, and read the scale, by pulling down words, when the pinch roller just stops in the play mode, the reading should be 250 g ~ 470 g (8.8 oz ~ 16.5 oz).

4-5 CAPSTAN ASS'Y THRUST CHECK

Check that the capstan fly wheel is pressed to the capstan housing side by the capstan holder.

4-6 LUBRICATION

Lubrication is only required when parts are replaced. For this purpose, use the oil specified below.

Oil: Mobil D.T.E. Oil Light, or equivalent

Apply a drop of oil with an oil applicator to a point about 1/3 the way down the shaft (from the free end) of the flywheel, then insert the shaft into the capstan housing.

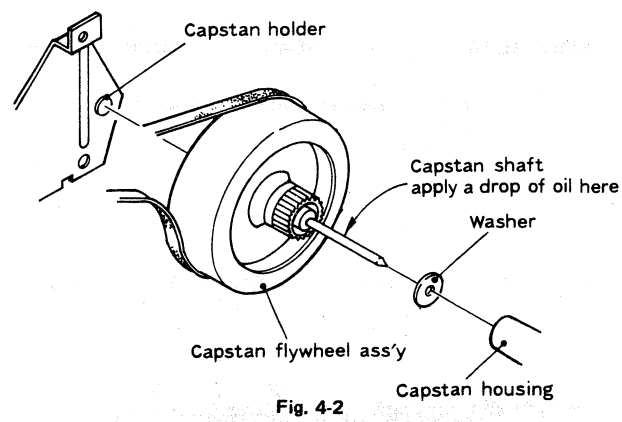


Fig. 4-2

5 ELECTRICAL ADJUSTMENT AND CHECKS

PRECAUTIONS

1. Before performing adjustments and checks clean and demagnetize the entire tape path.
2. Make sure the deck is properly set for the voltage in your locality.
3. In general, adjustments and checks are made in the order of L-ch then R-ch. Double REF. Nos. and test point designations indicate L-ch/R-ch. (Example: R11/R21)
4. 0 dB is referenced to 0.775 V. If an AC voltmeter that references 0 dB to 1 V is used, appropriate compensation should be made.
5. The AC voltmeter used in the procedures must have an input impedance of 1 M-ohmes or more.
6. Note the "Deck settings" at the top of each chart. The settings apply to all check for a specific chart unless explicitly stated otherwise.
7. Since this deck has an automatic tape selector, be sure to use test tapes that have tape position detecting holes.

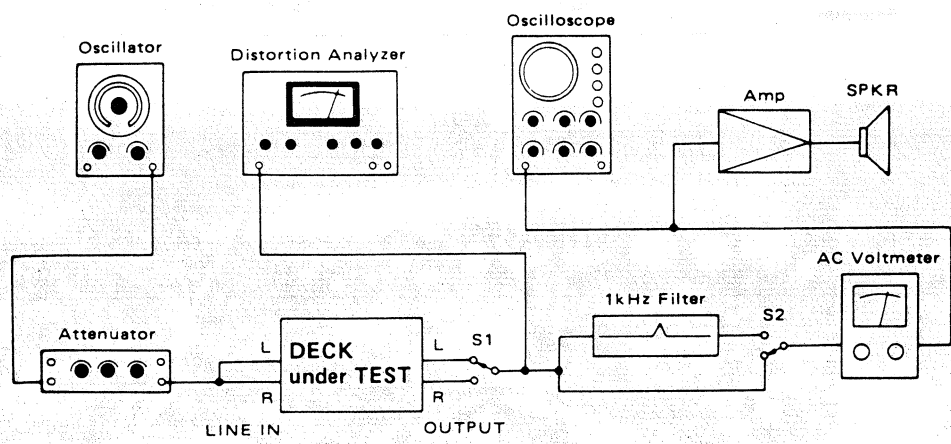


Fig. 5-1 Basic test setup

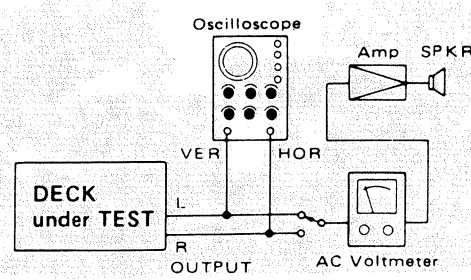


Fig. 5-2 Test setup for azimuth check

5-1 ADJUSTMENTS AND TEST POINT LOCATIONS

Function		Adjustments	Test points (Measuring point)
Specified output level		R11/R21 R12/R22	T.PL/T.PR (DOLBY)
PB Frequency Response		R16/R26	OUTPUT terminals
Bias OSC		L301	T.PL/R
Record bias	METAL	R13/R23	OUTPUT terminals
	CrO_2	R32	
	NORMAL	R31	
Record level	METAL	R14/R24	OUTPUT terminals
	Cr (CrO_2)	Check	
	NORMAL		
REC/PLAY Frequency Response		Check	OUTPUT terminals

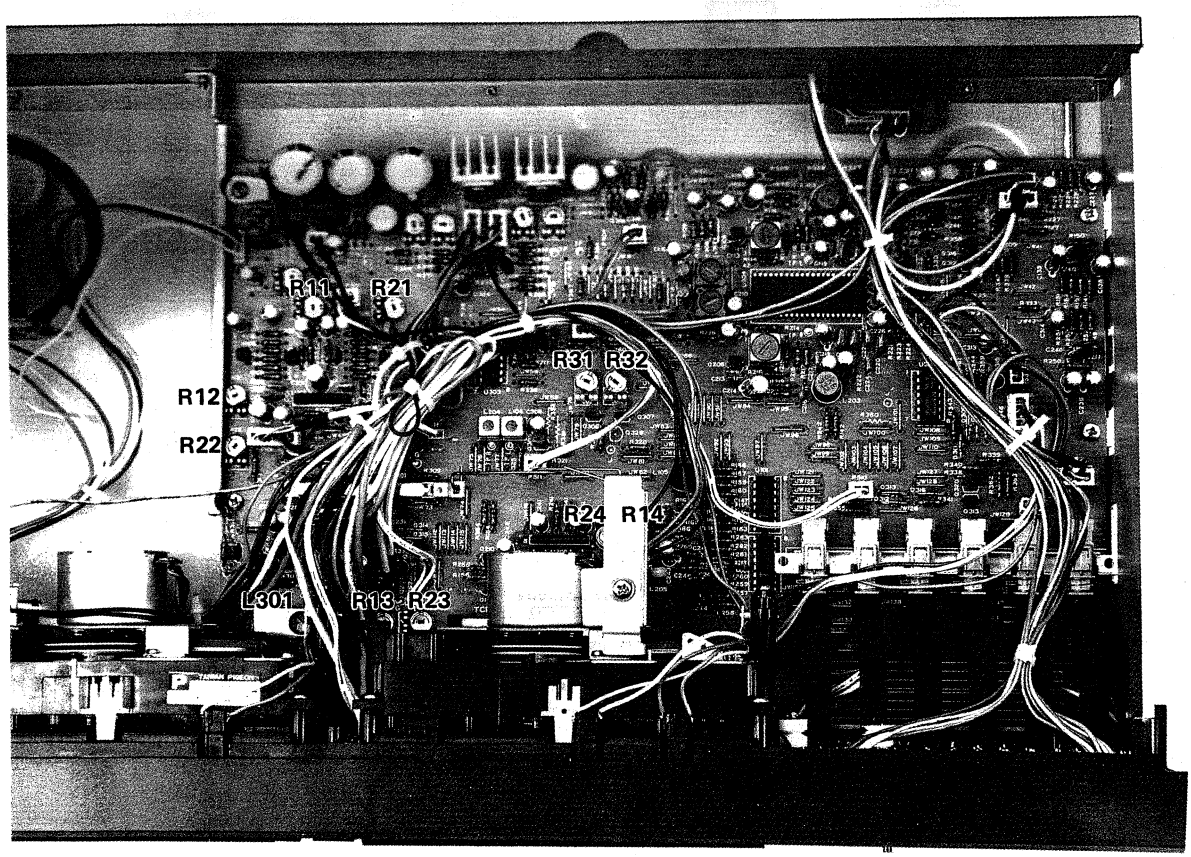


Fig. 5-3

5-2 PLAYBACK PERFORMANCE

Deck settings:
DOLBY NR sw: OUT

Test tapes:
MTT-150C: For Dolby level calibration
MTT-257: For playback frequency response check for NORMAL
MTT-357: For METAL and CrO_2
MTT-551: For S/N check with NORMAL

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
1. REC/PLAY head azimuth	Connection: Fig. 5-2	MTT-150C	Check	OUTPUT: Phase: within 45°	Refer to Fig. 5-5
		MTT-257 (10 kHz)	Azimuth screw of R/P head (Fig. 5-4)	OUTPUT: Max. output at L-& R-ch's (on VTVM)	
2. Specified output level	—	MTT-150C	R11/R21 (Play A) R12/R22 (Rec/Play B)	T.P (DOLBY): 245mV (−10 dB)	See page 8
	—	MTT-150C	Check	OUTPUT: −3.5 dB ± 1 dB (461 to 581mV)	Spec. output level
3. Frequency response	NORMAL	MTT-257	R16/R26	OUTPUT: Fig. 5-8	
	CrO_2	MTT-357	Check	OUTPUT: Fig. 5-8	
4. Signal-to-noise ratio S/N	Tape: MTT-551 Play mode	Fully erased MTT-551 tape (Use bulk tape *eraser*)	Check	OUTPUT: 46 dB min.	Ratio of spec. output of −3.5 dB to noise

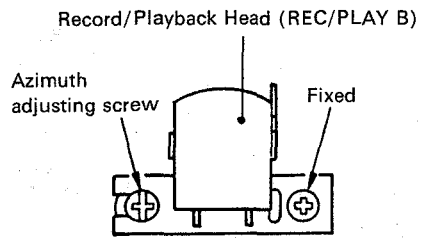


Fig. 5-4

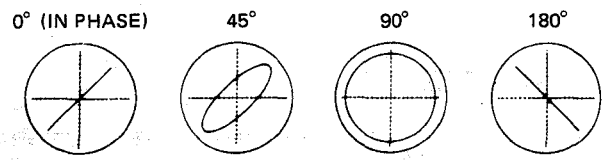


Fig. 5-5

5-3 MONITOR PERFORMANCE

Deck settings:
RECORD-PAUSE mode
DOLBY NR sw: OUT

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
5. Min. input level	REC LEVEL cont. (L/R): MAX	MIC: 400Hz/–67 dB (346μV) LINE IN: 400Hz/ –19 dB (86.9mV)	Check	OUTPUT: –3.5 dB ± 3 dB (366mV to 731mV)	MIC min. input level LINE min. input level
6. Specified LINE input level	–	LINE IN: 400Hz/–9 dB (275mV)	REC LEVEL cont. (L/R)	T.P11/T.P12 (DOLBY): 245mV (–10 dB)	Reter to Fig. 5-7
	–	LINE IN: 400Hz/–9 dB (275mV)	Check	OUTPUT: –3.5 dB ± 1 dB (461mV to 581mV)	
	IMPORTANT: Do not change the setting of the REC LEVEL controls after establishing their setting as above.				
7. Peak level display	–	LINE IN: 400Hz/–9 dB (275mV)	Check	PEAK LEVEL DISPLAY: 0 dB (775mV)	
8. Headphone output level	Connection: Fig. 5-6	LINE IN: 400Hz/–9 dB (275mV)	Check	PHONES: –19 dB ± 3 dB (61.5mV to 122mV)	8 ohm load

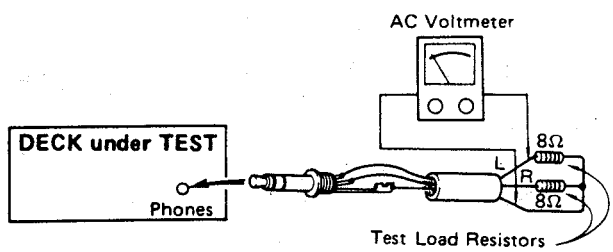


Fig. 5-6 Test setup for headhone check

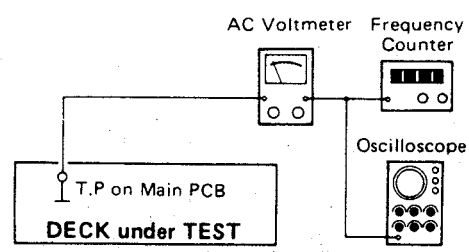


Fig. 5-7 Test setup for bias adjustment

5-4 RECORDING PERFORMANCE

Deck settings:
DOLBY NR sw: OUT
REC LEVEL cont. (L/R): Specified position (item 6)

Recording test tapes:
MTT-5571: For METAL
MTT-5561: For CrO_2
MTT-5511: For NORMAL

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
9. Bias osc	Connection: Fig. 5-7 Record-pause mode	LINE IN: No signal	L301	T.PL/R 100kHz on frequency counter	Specified bias frequency
10. Record bias	Tape: MTT-5571 Rec/play mode	LINE IN: 400Hz & 10kHz alternately/−42 dB (6.15mV) Record and reproduce them.	R13/R23	OUTPUT: Nearly equal level at both trequencies	Repeat if the result is unsatisfactory
	Tape: MTT-5561 Rec/play mode		R32		
	Tape: MTT-5511 Rec/play mode		R31		
11. Record level	Tape: MTT-5571	LINE IN: 400Hz/−12dB (195mV) Record and reproduce them.	R14/R24	OUTPUT: −6.5dB (367mV)	
	Tape: MTT-5561 Tape: MTT-5511		Check	OUTPUT: −6.5dB ± 1.5dB (308mV to 436mV)	
12. Total harmonic distortion	Tape: MTT-5571 Tape: MTT-5561 Tape: MTT-5511 Rec/Play mode	LINE IN: 400Hz/−12 dB (195mV)	Check	OUTPUT: 2.5% or less with CrO_2, NORMAL METAL	
13. Frequency response	Tape: MTT-5571 Tape: MTT-5561 Tape: MTT-5511	LINE IN: Required signal/ −42 dB (6.15mV)	Check	OUTPUT: Fig. 5-9 to 5-10	If out of spec., recheck #10
14. Signal-to-noise ratio	Tape: MTT-5571 Tape: MTT-5561 Tape: MTT-5511	LINE IN: 1kHz/−9 dB (275mV) ↓ no signal	Check	OUTPUT: 46 dB min. [METAL, CrO_2] 45dB min. [NORMAL]	Ratio of specified output of −2dB to noise
15. Erase efficiency	Connection is same as in Fig. 5-1, but engage 1-kHz filter. Record a 1-kHz signal. Rewind tape to midpoint of recorded portion. Erase the recorded portion with no input signal. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	Tape: MTT-5571	LINE IN: 1kHz/+1dB (0.869V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level: +8dB (1.95V)
16. Channel seperation	• Connection: Fig. 5-1, but do not connect LINE in (R), and engage 1-kHz filter. • Set the deck to record mode. Find the difference between the 1-kHz recorded portion (L-ch) and the "no signal" portion (R-ch).				
	Tape: MTT-5561 (CrO_2)	LINE IN: L-ch 1 kHz/−9 dB (275mV) R-ch No signal	Check	OUTPUT: 30 dB min. ratio	

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
17. Adjacent track crosstalk	• Connection: Fig. 5-1, but do not connect LINE in (L) and OUTPUT (L). • Record a 125-Hz signal on R-ch and note output level. Invert tape and play R-ch track. Check leakage level against the output reference of previously recorded portion.				
	Tape: MTT-5571	LINE IN: L-ch No signal R-ch 125Hz/–9 dB (275mV)	Check	OUTPUT: 40dB min. ratio	
18. REC MUTE function	Connection: Fig. 5-1, but engage 1-kHz filter. Record a 1-kHz signal. Push REC MUTE button for several seconds. (At this time, make sure LED lights). Rewind and play the tape. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	(REC/PLAY B) Tape: MTT-5571	LINE IN: 1kHz/+1dB (0.869mV) ↓ no signal	Check	OUTPUT: 55 dB min. ratio	Ref. output level: +8dB (1.95V)
19. DOLBY NR effect (B-type)	Record a 1-kHz signal with DOLBY NR switch in OUT. Play this portion with DOLBY NR switch set to OUT and IN. Obtain the difference in output level between OUT and IN positions. Repeat the above process using a 10-kHz signal.				
	Tape: MTT-5571	LINE IN: 1 kHz/–29 dB (27.5mV)	Check	OUTPUT: Variation 3 dB ~ 8 dB	
	Tape: MTT-5571	LINE IN: 10kHz/–39 dB (8.69mV)	Check	OUTPUT: Variation 8 dB ~ 12 dB	
20. DOLBY NR effect (C-type)	Repeat the same procedure above, except see the DOLBY NR □□-B/□□-C switch is set to □□-C.				
	Tape: MTT-5571	LINE IN: 1 kHz/–39 dB (8.69mV)	Check	OUTPUT: Variation 16 dB ~ 20 dB	
	Tape: MTT-5571	LINE IN: 10 kHz/–49 dB (2.75mV)	Check	OUTPUT: Variation 16 dB ~ 20 dB	

5-5 FREQUENCY RESPONSE

5-5-1 PLAYBACK

Tape: MTT-257 (NORMAL)
Tape: MTT-357 (CrO_2/METAL)

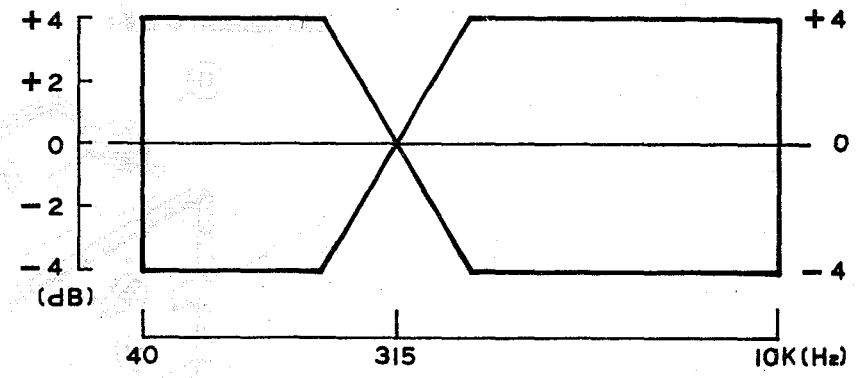


Fig. 5-8 Playback frequency response

5-5-2 OVERALL

Tape: MTT-5511 (NORMAL)
Tape: MTT-5561 (CrO_2)
Tape: MTT-5571 (METAL)

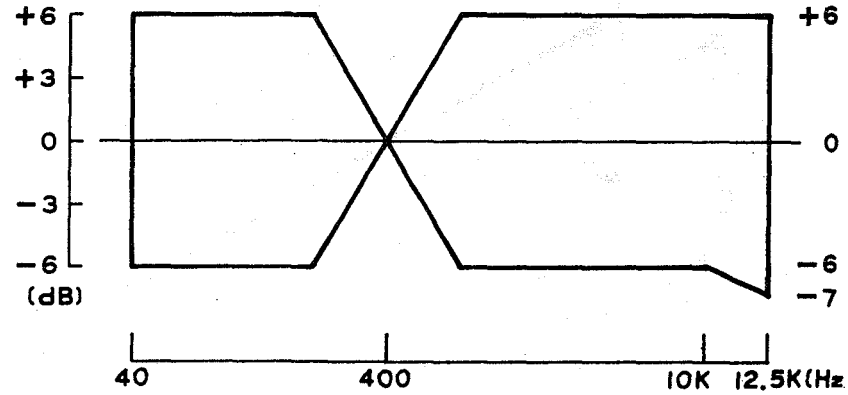


Fig. 5-9 Overall frequency response (Dolby NR: IN)

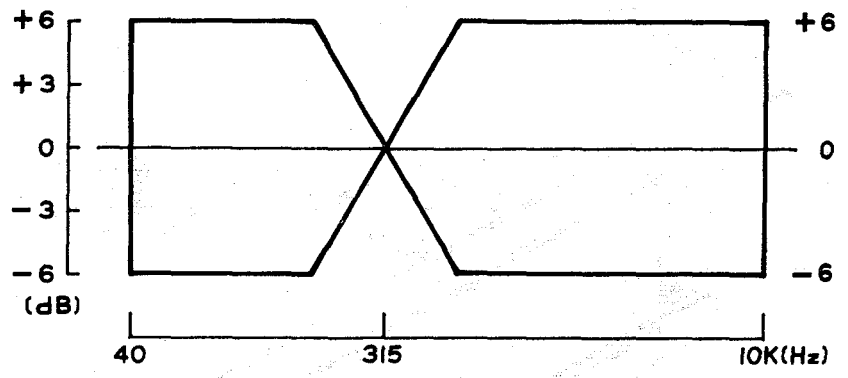
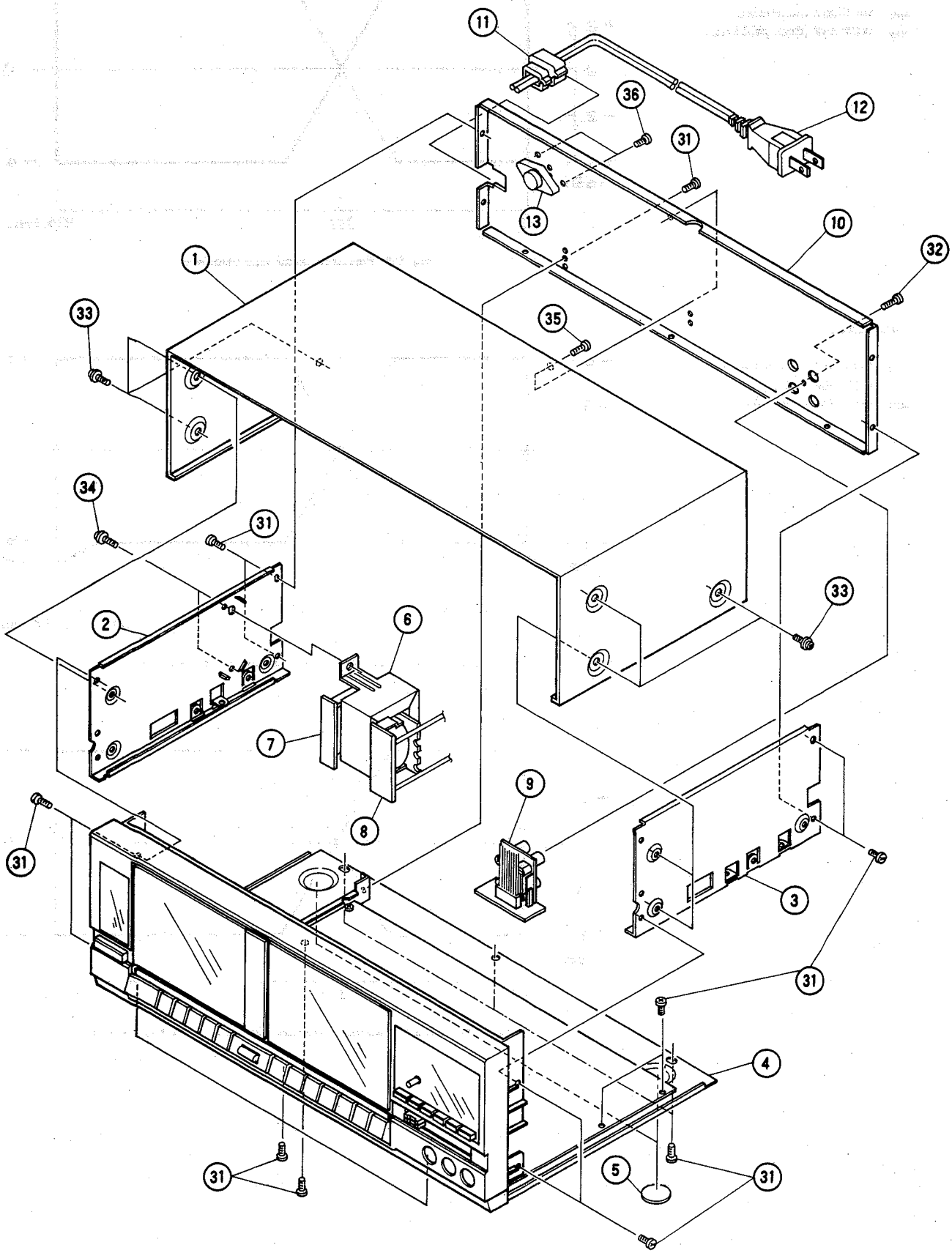


Fig. 5-10 Overall frequency response (Dubbing: Low/High speed)

6 EXPLODED VIEWS AND PARTS LIST

EXPLODED VIEW-1



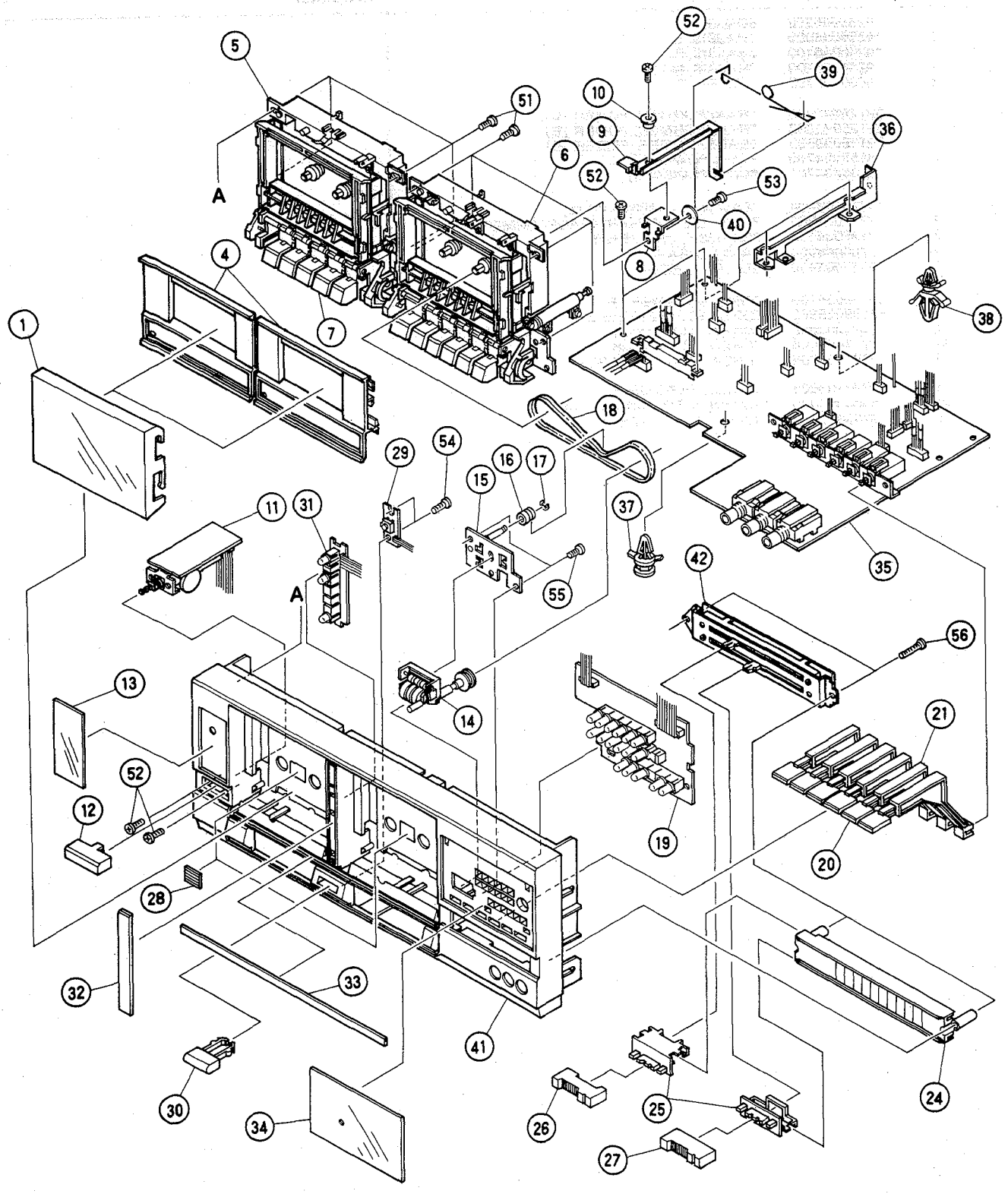
EXPLODED VIEW - 1

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
1 - 1	*9260045300	BONNET	
1 - 2	*9260046000	CHASSIS, L	
1 - 3	*9260046100	CHASSIS, R	
1 - 4	*9260045200	CHASSIS, MAIN	
1 - 5	*5800620400	LEG, FELT	
1 - 6	⚠9125043000	TRANSFORMER, POWER [U]	
	⚠9125043200	TRANSFORMER, POWER [E]	
	⚠9125043500	TRANSFORMER, POWER [C]	
1 - 7	9155034700	PCB A POWER [U, C.]	
	9155034701	PCB A POWER [E]	
	5327009200	TERMINAL LAPPING 2P [E]	
1 - 8	9145034800	PCB B ASSY, POWER TRANSFORMER	
1 - 9	9145034600	PCB ASSY, IN/OUTPUT	
1 - 10	*9260046800	PANEL, REAR	
1 - 11	5317003400	BUSHING #2271	
1 - 12	⚠9109025700	CORD, AC POWER [E]	
	⚠9109025800	CORD, AC POWER [U, C]	
1 - 31	9783203006	SCREW, BTT-S M3x6	
1 - 32	9783603008	SCREW, BTT-P M3x8	
1 - 33	9783053006	SCREW, CAP-S M3x6 BLK	
1 - 34	9783103008	SCREW, CAP-S M3x8	
1 - 35	5783593008	SCREW, C TITE M3x8 NI-BLK	
1 - 36	9783032600	SCREW, PTT-P M2.6x8	

Parts marked with *require longer delivery time. [U] : U.S.A. [C] : CANADA [E] : EUROPE

D-30W

EXPLODED VIEW-2

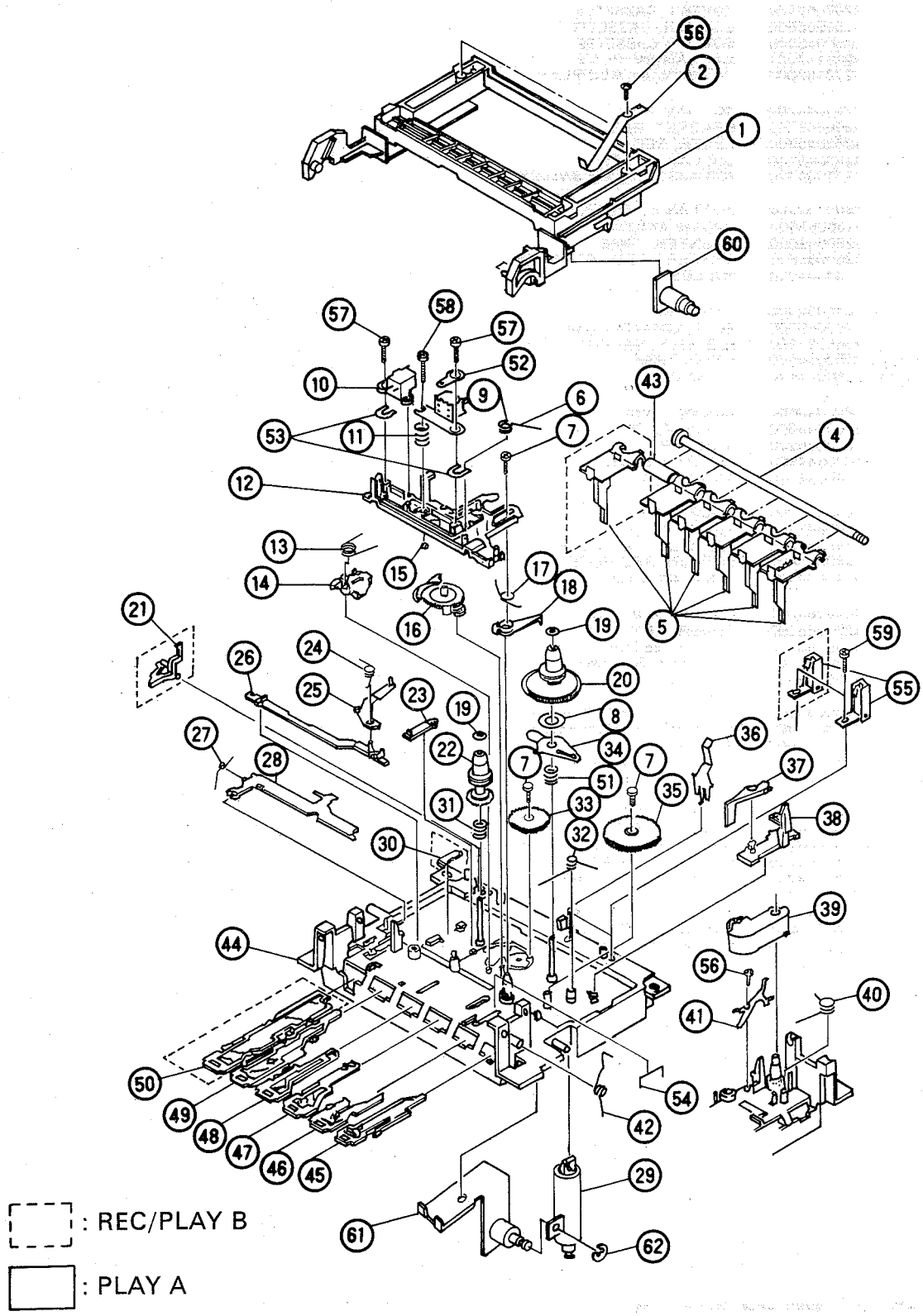


EXPLODED VIEW-2

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
2 - 1	9260065500	COVER I, CASSETTE	
	9260065600	COVER II, CASSETTE	
2 - 4	9260043700	COVER B CASSETTE	
2 - 5	*9278147001	MECHANISM, PLAY	
2 - 6	*9278162000	MECHANISM, REC/PLAY	
2 - 7	9260044200	BUTTON, KEY	
2 - 8	9260045700	BRACKET, REC	
2 - 9	9260045600	LEVER, REC	
2 - 10	9260045100	COLLAR, LEVER	
2 - 11	9145034300	PCB ASSY, POWER SWITCH	
2 - 12	5800752300	BUTTON B, POWER	
2 - 13	9260065600	COVER, MODEL	
2 - 14	9260049900	COUNTER, TAPE	
2 - 15	9260045800	BRACKET ASSY, COUNTER	
2 - 16	9260044900	PULLEY	
2 - 17	9786002000	E RING ϕ2	
2 - 18	9260049500	BELT, COUNTER ϕ59	
2 - 19	9145034200	PCB ASSY, METER	
2 - 20	9260034500	KNOB, PUSH	
2 - 21	9260044100	LINKAGE	
2 - 22	9260043800	LEVER L, VR	
2 - 23	9260043900	LEVER R, VR	
2 - 24	9260035200	RAIL, VR	
2 - 25	5800644900	LEVER, REC VR	
2 - 26	9260034100	KNOB A VR	
2 - 27	9260034200	KNOB B, VR	
2 - 28	5800643200	SEAL, REFLECT	
2 - 29	9145034400	PCB ASSY, REC MUTE	
2 - 30	9260044800	BUTTON, REC MUTE	
2 - 31	9145034500	PCB ASSY, LED	
2 - 32	9260065301	COVER, DUB LED	
2 - 33	9260065200	COVER, KEY	
2 - 34	9260065100	COVER, METER	
2 - 35	9145034103	PCB ASSY, R/P AMP	
2 - 36	9260046300	BRACKET, PCB	
2 - 37	9260050900	SUPPORT, SPACER HBS-5T	
2 - 38	9260050800	SUPPORT, SPACER HBS-5L	
2 - 39	9260045500	BAR, REC	
2 - 40	9785023400	WASHER ϕ3xϕ18xt0.8	
2 - 41	9260065000	PANEL FRONT [U, E]	
	9260005700	PANEL FRONT [C]	
2 - 42	9245034900	PCB ASSY, REC VR	
2 - 51	9783603010	SCREW, BTT-P M3x10	
2 - 52	9783203006	SCREW, BTT-S M3x6	
2 - 53	9783202606	SCREW, BTT-S M2.6x6	
2 - 54	9783033008	SCREW, PTT-P M3x8	
2 - 55	9783603008	SCREW, BTT-P M3x8	
2 - 56	9783033016	SCREW, PTT-P M3x18	

Parts marked with *require longer delivery time. [U] : U.S.A. [C] : CANADA [E] : EUROPE

EXPLODED VIEW-3

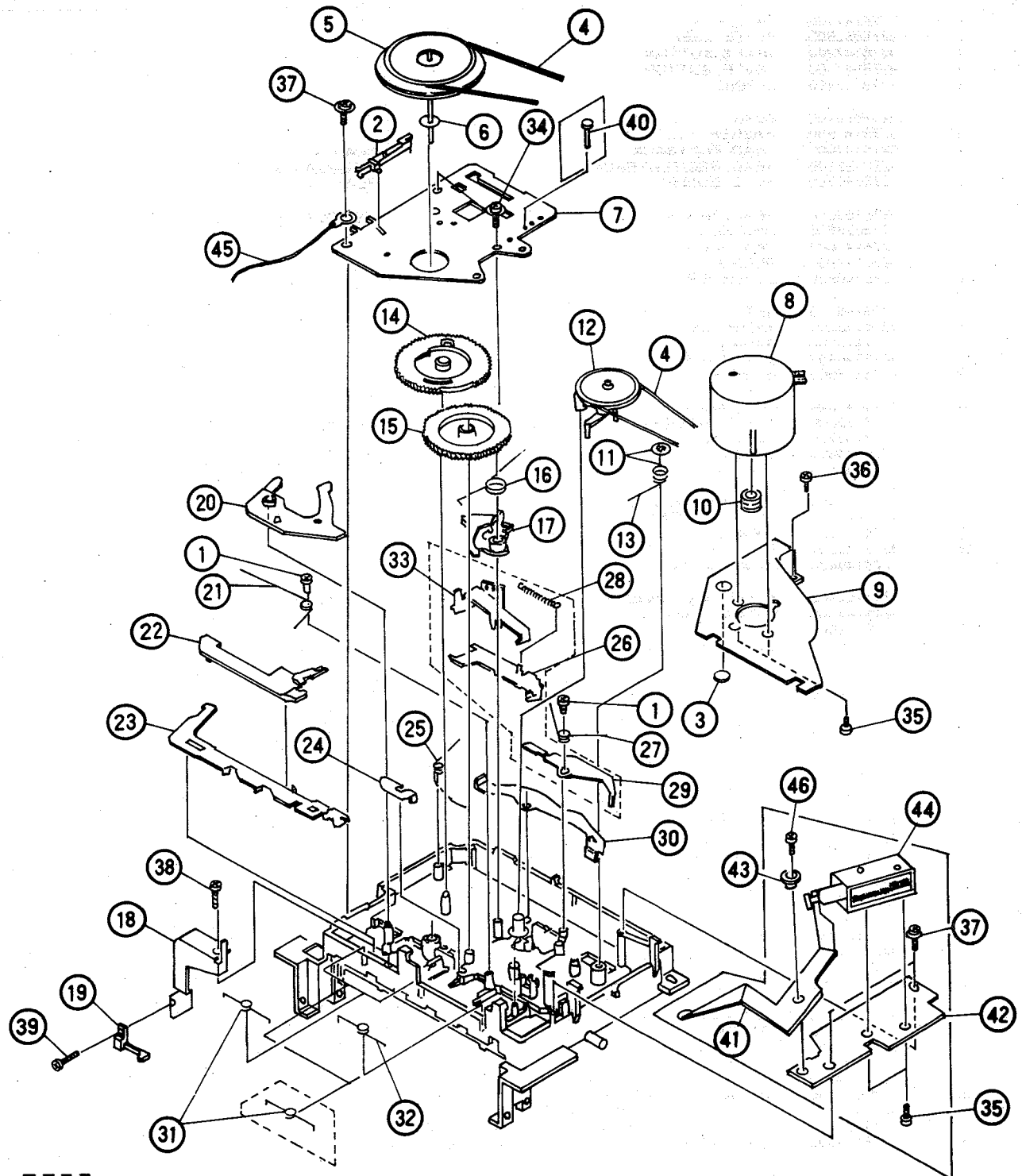


EXPLODED VIEW - 3

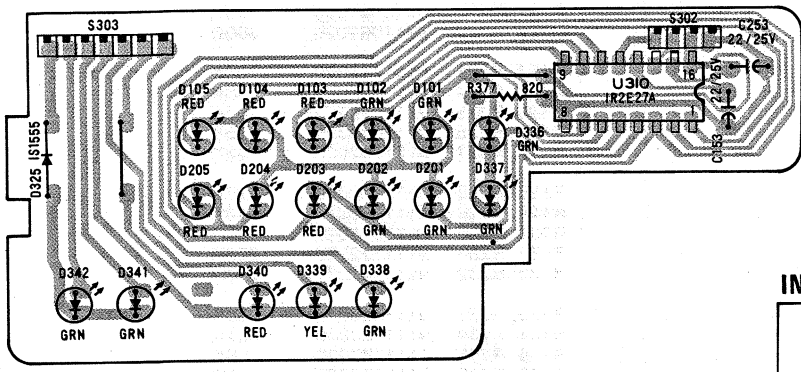
REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
3 - 1	*9278147100	CASE, C	
3 - 2	*9278052800	PLATE, KEEP	
3 - 4	*9278147200	SHAFT, BUTTON	
3 - 5	*9278147300	LEVER, BUTTON	
3 - 6	*9278147400	SPRING	
3 - 7	*9278056100	BUSH	
3 - 8	9278147500	WASHER, FELT	
3 - 9	9278147601	HEAD, PLAYBACK	PLAY A
	9278162100	HEAD, REC/PLAYBACK	REC/PLAY B
3 - 10	9278147700	HEAD, DUMMY	PLAY A
	9278162200	HEAD, ERASE	REC/PLAY B
3 - 11	*9278023500	SPRING, C	
3 - 12	*9278147800	HEAD BASE	
3 - 13	*9278147900	SPRING	
3 - 14	*9278148000	LEVER, F.R.	
3 - 15	*9278148100	NUT	
3 - 16	*9278148200	IDLER ASS'Y, P	
3 - 17	*9278148300	SPRING	
3 - 18	*9278148400	LEVER, RISET	
3 - 19	*9278148500	WASHER	
3 - 20	*9278148600	REEL ASS'Y, T	
3 - 21	*9278162300	PLATE, INTER ROCK	REC/PLAY B
3 - 22	*9278148700	REEL ASS'Y, S	
3 - 23	*9278148800	LEVER, F.R. UNLOCK	
3 - 24	*9278148900	SPRING	
3 - 25	*9278149000	LEVER, P UNLOCK	
3 - 26	*9278149100	PLATE, PL LOCK	
3 - 27	*9278149200	SPRING	
3 - 28	*9278149300	PLATE, F.R. LOCK	
3 - 29	*9278149400	DAMPER ASS'Y	
3 - 30	*9278162400	PLATE, REC COVER	REC/PLAY B
3 - 31	*9278149500	SPRING, S BRAKE	
3 - 32	*9278149600	SPRING	
3 - 33	*9278149700	GEAR, F IDLER	
3 - 34	*9278149800	CAM, SENSER	
3 - 35	*9278149900	GEAR, AS	
3 - 36	*9278150000	HOLDER, CASSETTE	
3 - 37	*9278150100	CAM, EJECT	
3 - 38	*9278150200	LEVER, LATCH	
3 - 39	*9278150300	ARM ASS'Y, PINCH	
3 - 40	*9278150400	SPRING	
3 - 41	*9278150500	LUG, EARTH	
3 - 42	*9278150600	SPRING	
3 - 43	*9278150700	COLLAR	
3 - 44	*9278150800	CHASSIS ASS'Y	
3 - 35	*9278150900	LEVER, SE	
3 - 46	*9278151000	LEVER, PAUSE	
3 - 47	*9278151100	LEVER, FF	
3 - 48	*9278151200	LEVER, REW	
3 - 49	*9278151300	LEVER, B, PL	
3 - 50	*9278162500	LEVER, REC	REC/PLAY B
3 - 51	*9278151400	SPRING	
3 - 52	*9278103200	LUG, EARTH	
3 - 53	*9278151500	SPACER	
3 - 54	*9278151700	PIN, LOCK	
3 - 55	*9278154400	SWITCH, LEAF	
3 - 56	9278030300	SCREW, TAPPING; M2x5	
3 - 57	9278154500	SCREW, TAPPING; M2x8	
3 - 58	9278154600	SCREW, TAPPING; M2x10	
3 - 59	9278154900	SCREW, TAPPING; M2.6x6	
3 - 60	*9278155300	HOLDER, DAMPER, F	
3 - 61	*9278155400	HOLDER, DAMPER, R	
3 - 62	9278155500	E RING; E-2	

Parts marked with *require longer delivery time. [U]: U.S.A. [C]: CANADA [E]: EUROPE

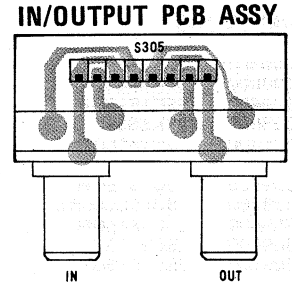
EXPLODED VIEW-4



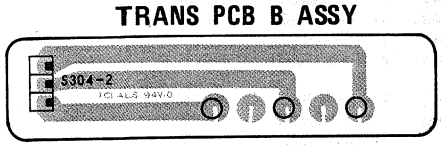
LEVEL METER PCB ASSY



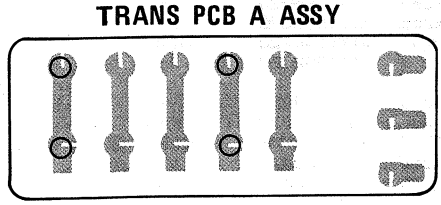
IN/OUTPUT PCB ASSY



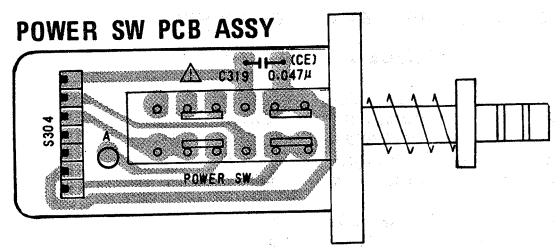
TRANS PCB B ASSY



TRANS PCB A ASSY

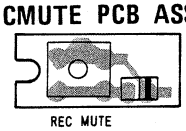


POWER SW PCB ASSY



LED PCB ASSY

RECMUTE PCB ASSY



R/P AMP PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	9155034002	PCB [U, C]
	9155034015	PCB [E]
	IC'S	
U101, U201	9167009500	TD62504P
U301, U302	9167010400	μPC1228H
U303	9167009800	TC4066BP
U304	5220427000	CX20187
U305, U306	52204162000	M5218L
U307	9167009600	TC4081BP
U308, U309⚠*	9167010600	μPC78M12H
	TRANSISTORS	
Q101, Q201	5232008900	2SK583
Q102, Q202	5232008900	2SK583
Q106, Q206	9163309400	2SC1815GR
Q107, Q207	5232008900	2SK583
Q109, Q209	9163309400	2SC1815GR
Q110, Q210	9163309400	2SC1815GR
Q111, Q211	9163309700	2SC732TM-BL
Q302~Q304	9163309400	2SC1815GR
Q305	9163309800	2SC2120Y
Q306, Q307	9163309400	2SC1815GR
Q308, Q309	9163009900	2SA1015GR
Q310~Q313	9163309400	2SC1815GR
Q314, Q315	9163009900	2SA1015GR
Q316~Q320	9163309400	2SC1815GR
Q321	9163609300	2SD1406Y
Q322~Q327	9163309400	2SC1815GR
	DIODES	
D301	9165020200	IS1555
D302	9165020500	IN4003
D303	9165020200	IS1555
D305~D316	9165020200	IS1555
D317, D318	9165020500	IN4003
D319~D321	9165020200	IS1555
D322 ⚠*	9165020700	IB4B1
D323, D324	9165020200	IS1555
	CARBON RESISTORS	
	All resistors are rated ±5% tolerance and ¼W.	
R102, R202	9111126020	330K
R103, R203	9111079020	3.6K
R104, R204	9111122020	220K
R105, R205	9111042020	100Ω
R106, R206	9111078020	3.3K
R107, R207	9111072020	1.8K
R108, R208	9111078020	3.3K
R109, R209	9111084020	5.6K
R111, R211	9111116020	120K
R112, R212	9111138020	1M
R113, R213	9111138020	1M
R114, R214	9111082020	4.7K
R115, R215	9111084020	5.6K
R116, R216	9111092020	12K
R117, R217	9111057020	430Ω
R118, R218	9111080020	3.9K
R119, R219	9111078020	3.3K
R120, R220	9111097020	20K

REF. NO.	PARTS NO.	DESCRIPTION
R121, R221	9111086020	6.8K
R122, R222	9111062020	680Ω
R123, R223	9111114020	100K
R124, R224	9111114020	100K
R125, R225	9111070020	1.5K
R126, R226	9111090020	10K
R127, R227	9111102020	33K
R128, R228	9111100020	27K
R129, R229	9111090020	10K
R130, R230	9111016020	10Ω
R131, R231	9111122020	220K
R132, R232	9111042020	100Ω
R133, R233	9111126020	330K
R134, R234	9111083020	5.1K
R135, R235	9111086020	6.8K
R136, R236	9111138020	1M
R138, R238	9111116020	120K
R140, R240	9111078020	3.3K
R141, R241	9111116020	120K
R142, R242	9111082020	4.7K
R143, R243	9111032020	39Ω
R144, R244	9111090020	10K
R145, R245	9111116020	120K
R146, R246	9111116020	120K
R147, R247	9111074020	2.2K
R148, R248	9111104020	39K
R149, R249	9111078020	3.3K
R150, R250	9111134020	680K
R151, R251	9111096020	18K
R152, R252	9111030020	33Ω
R153, R253	9111114020	100K
R154, R254	9111090020	10K
R155, R255	9111102020	33K
R156, R256	9111084020	5.6K
R157, R257	9111084020	5.6K
R158, R258	9111066020	1K
R159, R259	9111086020	6.8K
R160, R260	9111066020	1K
R161, R261	9111079020	3.6K
R162, R262	9111078020	3.3K
R163, R263	9111098020	22K
R164, R264	9111050020	220Ω
R165, R265	9111050020	220Ω
R166, R266	9111076020	2.7K
R167, R267	9111098020	22K
R168, R268	9111102020	33K
R169, R269	9110064000	820Ω (ELR)
R301	9111070020	1.5K
R302	9111102020	33K
R303	9111098020	22K
R304	9111084020	5.6K
R306	9111102020	33K
R307	9111090020	10K
R308	9111114020	100K
R309	9111090020	10K
R310	9111070020	1.5K
R311	9111102020	33K
R312, R313	9111098020	22K
R314	9111122020	220K
R315	9111074020	2.2K

Parts marked with *require longer delivery time. [U]: U.S.A. [C]: CANADA [E]: EUROPE

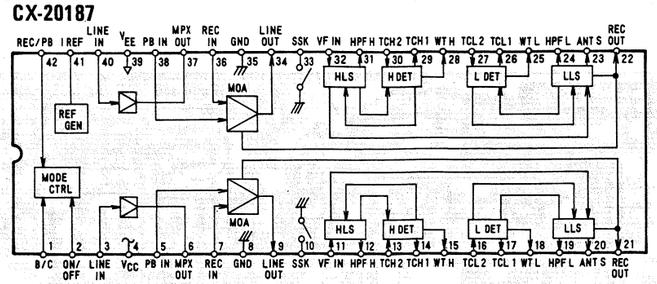
EXPLODED VIEW - 4

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
4 - 1	*9278056100	BUSH	
4 - 2	*9278151600	SWITCH, LEAF	
4 - 3	*9278151800	SUPPORT, CAPSTAN	
4 - 4	*9278151900	BELT	
4 - 5	*9278152000	FLYWHEEL ASS'Y	
4 - 6	9278022900	WASHER; φ2.1xφ4xt0.13	
4 - 7	*9278152100	HOLDER, GEAR	
4 - 8	*9278152200	MOTOR, EG-500KD-2B	
4 - 9	*9278152300	PLATE, MOTOR	
4 - 10	*9278152400	PULLY	
4 - 11	*9278152500	RING, CS	
4 - 12	*9278152600	ARM ASS'Y, F.R. IDLER	
4 - 13	*9278152700	SPRING	
4 - 14	*9278152800	GEAR, A, ASSIST	
4 - 15	*9278152900	GEAR, B, ASSIST	
4 - 16	*9278153000	SPRING	
4 - 17	*9278153100	LEVER, CAM, P	
4 - 18	*9278153200	PLATE, SWITCH	
4 - 19	*9278153300	SWITCH, LEAF	
4 - 20	*9278153400	LEVER, CAM, CR	
4 - 21	*9278153500	SPRING	
4 - 22	*9278153600	LEVER, START, F. R.	
4 - 23	*9278153700	LEVER, FRS	
4 - 24	*9278153800	PLATE, PROTECT	
4 - 25	*9278153900	SPRING	
4 - 26	*9278162600	PLATE, JOINT, REC	REC/PLAY B
4 - 27	*9278154000	SPRING	
4 - 28	*9278162700	SPRING, T	REC/PLAT B
4 - 29	*9278162800	PLATE, REC CHANGE	REC/PLAT B
4 - 30	*9278154100	LEVER, PL START	
4 - 31	*9278154200	SPRING	
4 - 32	*9278154300	SPRING	PLAY A
4 - 33	*9278162900	LEVER, RSW	REC/PLAY B
4 - 34	9278029900	SCREW, FLAT TAPPING; M2.6x6	
4 - 35	9278154700	SCREW, M2.6x4	
4 - 36	9278030800	D SCREW, M2.6x4	
4 - 37	9278154800	SCREW, FLAT TAPPING; M2.6x8	
4 - 38	9278154900	SCREW, TAPPING; M2.6x6	
4 - 39	9278155000	D SCREW, M1.7x6	
4 - 40	9278155100	D SCREW, M1.7x8	PLAY A
4 - 41	*9260045000	LEVER, SOLENOID	PLAY A
4 - 42	*9260046400	BRACKET, SOLENOID	PLAY A
4 - 43	*9260050400	COLLER, REC LEVER	PLAY A
4 - 44	*9278155201	SOLENOID, DC-24V	
4 - 45	9108198600	WIRE ASS'Y, LEAD	
4 - 46	9278155700	SCREW, M3x6	PLAY A

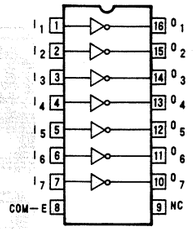
Parts marked with *require longer delivery time. [U]: U.S.A. [C]: CANADA [E]: EUROPE

7 IC BLOCK DIAGRAM

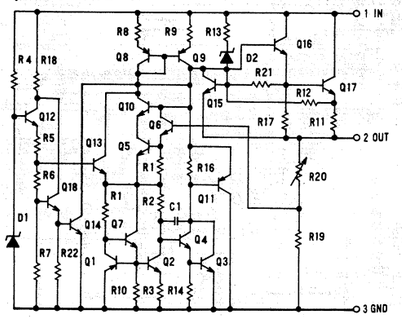
CX-20187



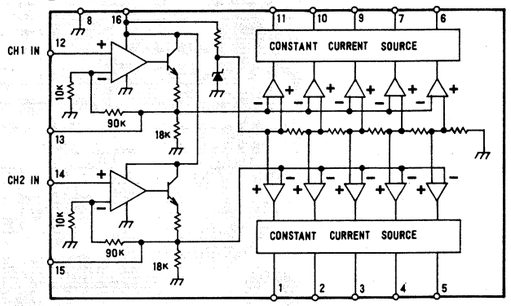
TD-62504P



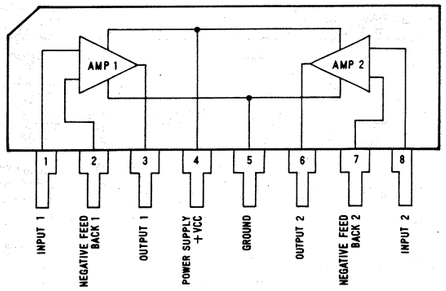
μPC 78M12H



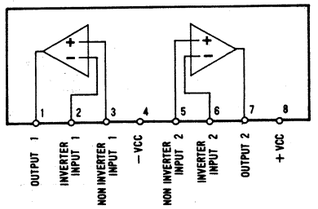
IR-2E27A



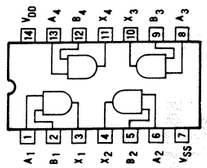
μPC1228H



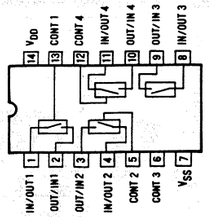
M5218L



TC4081BP

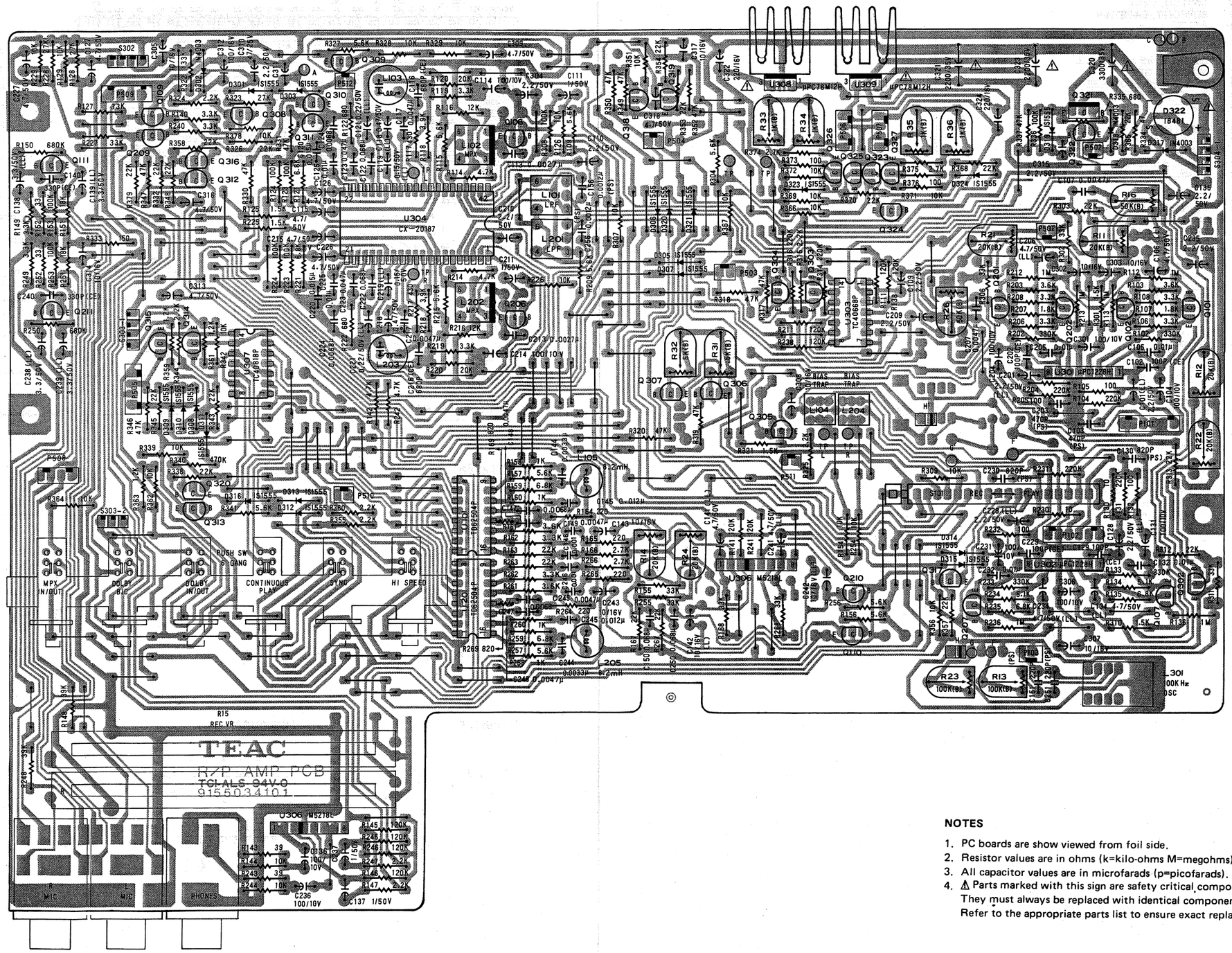


TC4066BP



8 PC BOARD AND PARTS LIST

REC/PLAY AMPL PCB ASSY



NOTES

1. PC boards are show viewed from foil side.
2. Resistor values are in ohms (k=kilo-ohms M=megohms).
3. All capacitor values are in microfarads (p=picofarads).
4. ⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components. Refer to the appropriate parts list to ensure exact replacement.

REF. NO.	PARTS NO.	DESCRIPTION
R316	9111122020	220K
R317~R320	9111106020	47K
R321	9111070020	1.5K
R322	9111102020	33K
R323	9111100020	27K
R324, R325	9111074020	2.2K
R326	9111098020	22K
R327	9111084020	5.6K
R329, R329	9111090020	10K
R330, R331	9111106020	47K
R332	9111098020	22K
R333	9111046020	150Ω
R334	9111205000	47Ω (Flameproof Metal Oxidé Film)
R335	9111062020	680Ω
R336	9111114020	100K
R337	9111106020	47K
R338	9111098020	22K
R339	9111090020	10K
R340	9111130020	470K
R341	9111084020	5.6K
R342	9111090020	10K
R343	9111098020	22K
R344	9111074020	2.2K
R345	9111098020	22K
R346, R347	9111106020	47K
R348	9111098020	22K
R349, R350	9111106020	47K
R351	9111090020	10K
R352	9111106020	47K
R353, R354	9111098020	22K
R355	9111074020	2.2K
R356	9111090020	10K
R357, R358	9111098020	22K
R359	9111068020	1.2K
R360	9111074020	2.2K
R361	9111068020	1.2K
R362	9111090020	10K
R363	9111068020	1.2K
R364	9111090020	10K
R365	9111098020	22K
R366, R367	9111090020	10K
R368	9111098020	22K
R369	9111090020	10K
R370	9111098020	22K
R371, R372	9111090020	10K
R373	9111042020	100Ω
R374, R375	9111076020	2.7K
R376	9111042020	100Ω
R378	9111090020	10K
R379	9111098020	22K
	CAPACITORS	
C101, C201	9117605000	Elec. 2.2μF 50V (LL)
C102, C202	9115787100	Ceramic 100PF 50VK
C103, C203	9115941000	Polyst. 470PF 50VJ
C104, C204	9117197000	Elec. 100μF 10V
C105, C205	9115555000	Mylar 0.01μF 50VJ
C106, C206	9117611000	Elec. 4.7μF 50V (LL)
C107, C207	9115547000	Mylar 0.0047μF 50VJ
C109, C209	9117081000	Elec. 2.2μF 50V

REF. NO.	PARTS NO.	DESCRIPTION
C110, C210	9117081000	Elec. 2.2μF 50V
C111, C211	9117066000	Elec. 1μF 50V
C113, C213	9115541000	Mylar 0.0027μF 50VJ
C114, C214	9117197000	Elec. 100μF 10V
C115, C215	9117111000	Elec. 4.7μF 50V
C116, C216	9115798000	Ceramic 680PF 50VK
C117, C217	9115547000	Mylar 0.0047μF 50VJ
C118, C218	9117603000	Elec. 0.47μF 50V (LL)
C119, C219	9117600500	Elec. 0.15μF 50V (LL)
C120, C220	9115559000	Mylar 0.015μF 50VJ
C121, C221	9117601000	Elec. 0.22μF 50V (LL)
C122, C222	9115575000	Mylar 0.068μF 50VJ
C123, C223	9115571000	Mylar 0.047μF 50VJ
C124, C224	9115551000	Mylar 0.0068μF 50VJ
C125, C225	9115555000	Mylar 0.01μF 50VJ
C126, C226	9117111000	Elec. 4.7μF 50V
C127, C227	9117111000	Elec. 4.7μF 50V
C128, C228	9117605000	Elec. 2.2μF 50V (LL)
C129, C229	9115787100	Ceramic 100PF 50VK
C130, C230	9115947000	Polyst. 820PF 50VJ
C131, C231	9117197000	Elec. 100μF 10V
C132, C232	9115555000	Mylar 0.01μF 50VJ
C134, C234	9117611000	Elec. 4.7μF 50V (LL)
C135, C235	9117081000	Elec. 2.2μF 50V
C136, C236	9117197000	Elec. 100μF 10V
C137, C237	9117066000	Elec. 1μF 50V
C138, C238	9117607000	Elec. 3.3μF 50V (LL)
C139, C239	9117607000	Elec. 3.3μF 50V (LL)
C140, C240	9115794100	Ceramic 330PF 50VK
C141, C241	9117611000	Elec. 4.7μF 50V (LL)
C142, C242	9117613000	Elec. 10μF 16V (LL)
C143, C243	9117138000	Elec. 10μF 16V
C144, C244	9115431000	Mylar 0.0033μF 50VJ
C145, C245	9115557000	Mylar 0.012μF 50VJ
C146, C246	9115531000	Mylar 0.01μF 50VJ
C147, C247	9115551000	Mylar 0.0068μF 50VJ
C148, C248	9115547000	Mylar 0.0047μF 50VJ
C149, C249	9115547000	Mylar 0.0047μF 50VJ
C150, C250	9115575000	Mylar 0.068μF 50VJ
C151, C251	9115933200	Polyst 220PF 100VJ
C156, C256	9115951001	Polyst 0.0012μF 50VJ
C301	9117197000	Elec. 100μF 10V
C302, C303	9117138000	Elec. 10μF 16V
C304	9117081000	Elec. 2.2μF 50V
C305	9117138000	Elec. 10μF 16V
C306	9117197000	Elec. 100μF 10V
C307, C308	9117138000	Elec. 10μF 16V
C309	9117111000	Elec. 4.7μF 50V
C310	9117184000	Elec. 47μF 25V
C311	9117081000	Elec. 2.2μF 50V
C312	9117198000	Elec. 100μF 16V
C313	9117111000	Elec. 4.7μF 50V
C314	9117138000	Elec. 10μF 16V
C315	9117081000	Elec. 2.2μF 50V
C316	9117111000	Elec. 4.7μF 50V
C317	9117138000	Elec. 10μF 16V
C318	9117111000	Elec. 4.7μF 50V
C320	⚠*9117279000	Elec. 3300μF 35V
C321	⚠*9117275000	Elec. 2200μF 35V
C322	9117213000	Elec. 220μF 16V
C323	⚠*9117275000	Elec. 2200μF 35V

Parts marked with *require longer delivery time. [U]: U.S.A. [C]: CANADA [E]: EUROPE

REF. NO.	PARTS NO.	DESCRIPTION
C324	9117213000	Elec. 220μF 16V
	VARIABLE RESISTORS	
R11, R21	9112017000	20K (B)
R12, R22	9112017000	20K (B)
R13, R23	9112002000	100K (B)
R14, R24	9112017000	20K (B)
R16, R26	9112001000	50K (B)
R31, R32	9112000000	5K (B)
R33~R36	9112019000	1K (B)
	COILS	
L101, L201	9122017501	100KHz (LPF)
L102, L202	5292803500	19KHz (LPF)
L103, L203	5292806000	19.8KHz (LPF)
L104, L204	9122011000	100KHz, Bias Trap
L105, L205	9122015300	8.2mH
L301	9173002001	100KHz, OSC Unit
	PLUGS	
P101, P102	9143146000	6P
P103	9143142000	2P (PTK)
P501~P504	9143142000	2P (PTK)
P505~P509	9143144000	4P (PTK)
P510~P512	9143142000	2P (PTK)
	MISCELLANEOUS	
R15	9172015300	REC VR 50K (A)x2
	9143117001	Mic Jack
	9143116000	Phone Jack
	9160012600	PIN, T.P
	9229021000	Earth Plate A
	9260046900	Heat Sinkx2
	9783203006	Screw, 2-BTT-S M3x6
	9135027900	Switch, Push, 6 Gang
S101	9134008100	Switch, Slide, 6-2

METER PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	9145034200	PCB Assy
	9155034200	PCB
	IC	
U310	5220036300	IR2E27A
	LED'S	
D101, D201	9174011200	GRN
D102, D202	9174011200	GRN
D103, D203	9174011100	RED
D104, D204	9174011100	RED
D105, D205	9174011100	RED
D336~D338	9174011200	GRN
D339	9174011300	YEL
D340	9174011100	RED
D341~D342	9174011200	GRN
	9260044000	Holder, LED

REF. NO.	PARTS NO.	DESCRIPTION
	CARBON RESISTOR	
R377	9111064020	820Ω, R-25JFT
	CAPACITORS	
C153, C253	9117254000	Elec. 22μF 25V
	DIODE	
D325	9165020200	IS1555

REC MUTE PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	9145034400	PCB Assy
	9155034400	PCB
	9136000500	Switch, Tact

LED PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	9145034500	PCB Assy
	9155034500	PCB
	LED'S	
D343~D345	9174011100	RED
	9260044000	Holder

INIOUTPUT PCB ASSY

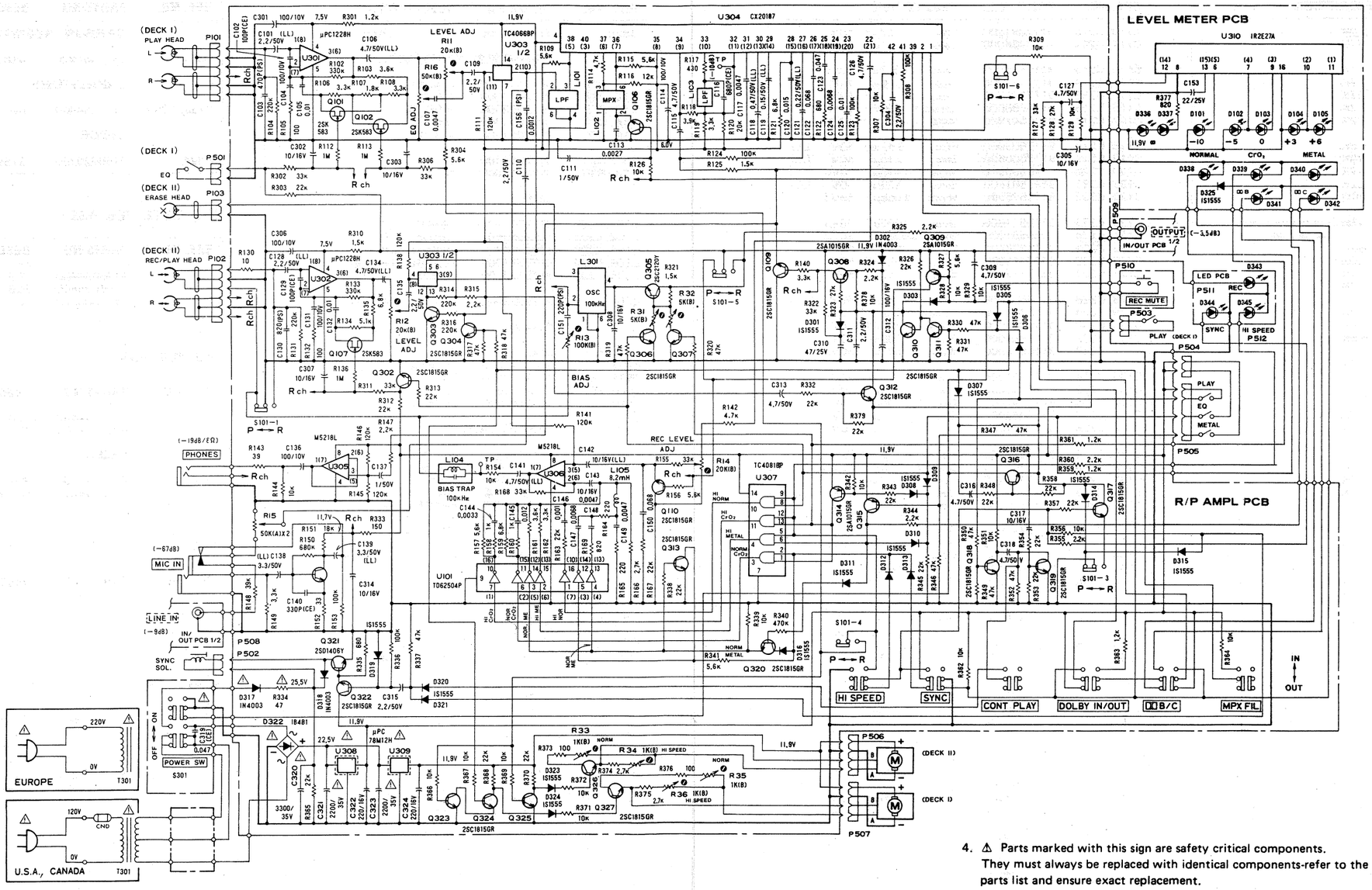
REF. NO.	PARTS NO.	DESCRIPTION
	9145034600	PCB Assy
	9155034600	PCB
	5330506600	PIN JACK, IN/OUTPUT 4P

POWER SW PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	9145034300	PCB Assy
	9155034300	PCB
S301	⚠*9135027800	Switch, Power, 4-2 (ALPS)
C319	9115823000	Capacitor, Ceramic 0.047μF

Parts marked with *require longer delivery time. [U]: U.S.A. [C]: CANADA [E]: EUROPE

SCHEMATIC DIAGRAM



INSTRUCTIONS FOR SERVICE PERSONNEL

BEFORE RETURNING APPLIANCE TO THE CUSTOMER, MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT.

NOTES

1. Schematic diagram shown for left channel except for some of the components.
2. All resistors are ¼ watt, ±5%, unless marked otherwise.
   Resistor values are in ohms (k = 1,000 ohms).
3. All capacitor values are in microfarads (p = picofarads).
   (CE) = Ceramic
4. ⚠ Parts marked with this sign are safety critical components.
   They must always be replaced with identical components-refer to the parts list and ensure exact replacement.
5. Voltage and level values are for referance only.
   0dB = 0.775V
   Indicated values are those existing when the peak level meter indicatis 0dB.
   Each Voltage value shown above is the one measured in REC PAUSE position and each mode.
6. ▭ : front panel indication
7. ▭ : rear panel indication